PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 3: B60Q 1/26; B60R 13/04

A1

(11) International Publication Number: WO 82/00272

(43) International Publication Date: 4 February 1982 (04.02.82)

(21) International Application Number: PCT/AU81/00090

(22) International Filing Date: 14 July 1981 (14.07.81)

(31) Priority Application Numbers: PE 4503
PE 5125

(32) Priority Dates: 14 July 1980 (14.07.80)
19 August 1980 (19.08.80)

(33) Priority Country: AU

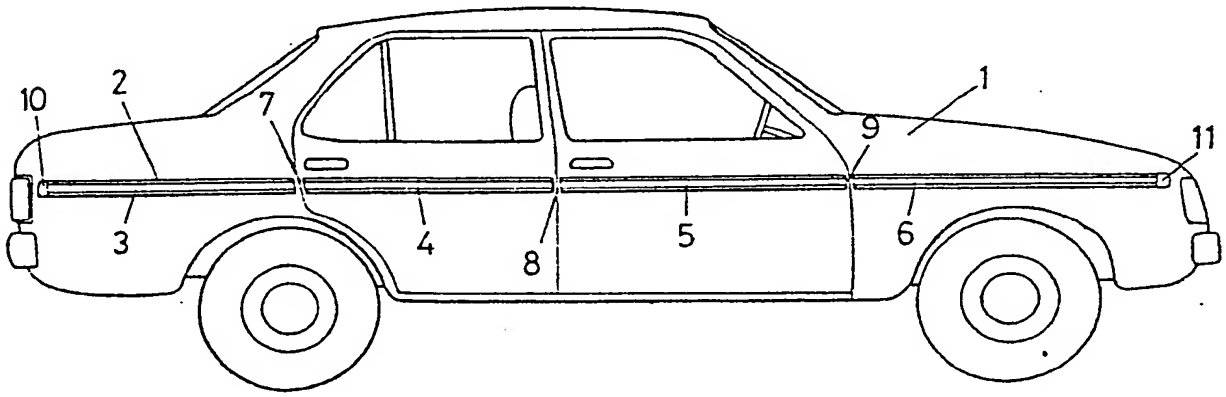
(71) Applicant; and
(72) Inventor: YOUNG, Frank, Oliver, Eyres [AU/AU]; 153 Grenfell Street, Adelaide, S.A. 5000 (AU).

(74) Agent: COLLISON & CO.; Savings Bank Building, 97 King William Street, Adelaide, S.A. 5000 (AU).

(81) Designated States: AT (European patent), AU, CH (European patent), DE (European patent), FR (European patent), GB (European patent), JP, NL (European patent), SE (European patent), US.

Published
With international search report

(54) Title: VEHICLE ILLUMINATION DEVICE



(57) Abstract

A vehicle illumination device comprising an elongated strip (3) of transparent or translucent material. Light entering the end from a light source (10, 11) is reflected off the back face and is visible along the length of the strip. Retention of light may be enhanced by the placing of luminescent material on the back face.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**KP**	Democratic People's Republic of Korea
AU	Australia	**LI**	Liechtenstein
BR	Brazil	**LU**	Luxembourg
CF	Central African Republic	**MC**	Monaco
CG	Congo	**MG**	Madagascar
CH	Switzerland	**MW**	Malawi
CM	Cameroon	**NL**	Netherlands
DE	Germany, Federal Republic of	**NO**	Norway
DK	Denmark	**RO**	Romania
FI	Finland	**SE**	Sweden
FR	France	**SN**	Senegal
GA	Gabon	**SU**	Soviet Union
GB	United Kingdom	**TD**	Chad
HU	Hungary	**TG**	Togo
JP	Japan	**US**	United States of America

"VEHICLE ILLUMINATION DEVICE"

This invention relates to an illumination device and more particularly an illumination device mountable on a vehicle.

There is a problem with existing illumination devices for vehicles in that they require a substantially constant energy input for a constant energy output and effectively such energy output is from a small source.

If it is desired to delineate the sides of vehicles for instance it is then necessary to provide a large number of point sources along the sides. It would be desirable if there could be provided a light strip along the side of a vehicle which could supply continuous light along the side without having to have a plurality of sources.

Another problem is that as intimated earlier if an energy source, usually electric, is taken away then the illumination disappears. It would be desirable therefore to provide a light source that would continue to emit light after its energization has been taken away.

It is the object therefore of this invention to provide a substantially elongate light source suitable for mounting on vehicles which light source may continue to emit light after its method of illumination has been taken away.

Luminescent materials are well known but their translation to vehicular applications has required some research and invention.

I have found that if an elongated strip of a translucent or transparent material is coated on one face with a luminescent material such as a luminescent paint and then affixed to a vehicle with the painted face inwards then incident light on the strip will pass into the strip and hence energize the luminescent material which will then retransmit as light from the stored energy and if the vehicle is in the dark the sides of the vehicle may be delineated.

I have further found that certain transparent or translucent materials may be energized by means of a light source from one end of the elongated strip so that light passing along the strip and within the strip is absorbed on the coated face and retransmitted from the coated face through to the outside face.

I have further found that if the face of the strip that is adjacent the luminescent material is abraded or roughened then better interception and absorption of light may occur.

One method I have found of the supply of artifical light to the elongated light strip is by means of a globe and reflector mounted in a light box at the end of the strip which reflector reflects light into the end of the strip. For this purpose it is advantageous that the end of the strip be highly polished.

Another method I have found for the supply of artificial light to the end of the elongate strip is by means of a light transmittable connection to an existing light on the vehicle. Such a form of light transmittable connection may be any optical fibre cable which extends from an existing light such as a head

light or side light in a vehicle to the end of the elongate strip.

In the case of a motor vehicle there may be light sources coming from both the tail lights and the head lights into an elongate strip extending along the full side of the vehicle.

I have further found it advantageous to support the elongate strip within a U or chanelled shape member which will protect the elongate strip and provide a bumper strip along the sides of the vehicle.

A suitable material from manufacture of the elongate strip is polymethylmethacrylate more commonly known as acrylic polymer and a suitable luminescent material may be formed from the blending of a polymeric or other material with a luminescent pigment. Suitable luminescent pigments may include sulphides of calcium or barium.

I have found that when a light strip according to this invention is placed along the sides of a motor vehicle it is of course necessary to provide breaks at intervals along the light strip to allow for the doors to open and I have found that if gaps are provided at portions along the elongate strip, light may still be caused to cross the gap provided the faces abutting the gap are suitably polished.

In one form therefore the invention is said to reside in a lightable display for attachment to a vehicle comprising an elongated member capable of transmitting light there along means for effecting transmission of light into at least one end of said member, the elongated member having at least a back face shaped or other

wise arranged whereby to intercept some of the light in the direction of elongation and to effect an externally visible lighting of the back face.

In a preferred form of the invention the externally visible lighting is promoted by the inclusion of a luminescent type material located along the back face.

In a further preferred form of the invention the externally visible lighting is enhanced by an alteration of the shape of the back face and such alteration may be by randomly shaped surface alterations or roughening of the back face such as by saw cuts.

In a further preferred form the elongated member comprises at least two separate portions adapted to be secured each on a vehicle and each in alignment one with respect to the other leaving a gap therebetween and being shaped or otherwise arranged to effect a transmission of light across such a gap.

In a preferred form of the invention the light may comprise an electric globe and reflector and in a further form it may comprise a glass fibre cable connection to a light source on the vehicle.

It may also be desirable to provide indicia embedded or engraved into the surface of the rod of the light strip so that information such as the name of the vehicle may be displayed in the light strip. Such engraving or embedding may be in the front or rear faces of the light strip.

To more clearly explain the invention several embodiments will be described with the aid of the drawings in which:

FIG. 1. is the representation of a motor vehicle with a light strip attached thereto,

FIG. 2. is a drawing of a portion of a light strip according to the invention,

FIG. 3. is a drawing of an alternative embodiment of a light strip,

FIG. 4. shows one method by which light may be caused to enter the light strip,

FIG. 5. shows another method by which light may be caused to enter the light strip, and

FIG. 6. shows a bicycle having a light strip illumination device.

Now looking at the drawings in more detail, FIG. 1 shows a motor vehicle 1 having a light strip 2 extending along almost the entire length of the side of the vehicle. The light strip 2 is divided into portions 3, 4, 5 and 6 which are fixed to the rear mud guard, the back door, the front door and the front mud guard respectively. The separate portions 4 make a continuous line along the side of the vehicle with small gaps 7, 8 and 9 respectively between the portions.

At each end of the light strip are light sources 10 and 11 respectively various embodiments of which are shown in FIGS. and 5.

Now looking at the light strip 2 in more detail two embodiments of these are shown in FIGS. 2 and 3.

FIG. 2 shows a body panel 12 of a motor vehicle upon which is attached by gluing or screwing a rubber bumper strip 13 of substantially U-shape with a semi-circular transparent rod 14 supported in the U-shaped strip 13. The back face 15 of the semi-circular transparent rod 14 is abraded or rough cut and is coated with a film of luminescent paint 16.

In the embodiment shown in FIG. 2 the legs 17 of the U or channel shape 13 do not extend out as far as the semi-circular edge of the rod 14. In the embodiment shown in FIG. 3 the legs 18 of the channel shape 13 extend out further than the front face of the rod 14 thereby providing a protective barrier for the rod.

FIG.4 shows one method by which light may be caused to enter the end of the light rod 2. At the end of the strip 2 the channel 13 terminates at a box 19 but the rod 14 extends into the box. Within the box an electric light globe 20 is surrounded by a reflector 21 which directs light into the end of the rod 22. In use a cover 23 extends over the whole of the light box 19.

FIG. 5 shows an alternative embodiment by means of which light may be caused to enter the light strip 2. In this embodiment a glass fibre rod or other light transmitting rod 24 extends between the end 25 of the light strip 2 and terminates at its other end within an exisiting lamp 26 on the vehicle. Such a lamp may be a side light or a head light. The end of the glass fibre rod 27 is adapted to collect light from within the reflector of the light 26. A protective bracket

27 protects the junction between the glass fibre rod and the light strip 2.

Such a glass fibre connection may be used at the front of a motor vehicle connecting the light strip to a head light or front side light and at the back of the vehicle connecting the light strip to a tail light. This would still give white light in at the rear as the light would be collected from inside the reflector.

In FIG. 6 a further embodiment of the light strip is shown incorporated on a bicycle. The bicycle 28 is of a mens bicycle type having a substantially triangular space 29 bounded by the main struts of the bicycle frame. Within this frame and adjacent this frame is a triangular light strip 30. Light boxes 31 and 32 provide light which extends into the ends of the light strip 30 and appropriate patterning 33 causes light to be shown from the light strip. Surface 34 adjacent the frame is roughened or machined to provide a rough surface and this surface painted with a luminescent paint.

It will be seen that by the various embodiments of this invention that there is provided a light strip which consists of a transparent rod backed by a face upon which is provided a roughened surface and luminescent paint and a light source is provided to transmit light along the rod such that light will be transmitted at all places along the rod and some light will be absorbed in the luminescent paint to be retransmitted later when there is no light emanating from the light boxes. By this means even after the light source has been removed or switched off the light strips will emit light for some time thereby providing a safety factor for pedestrians or other road users.

The luminescent paint will be activated by incident light falling on the light strip other than from the light boxes and hence will transmit light at night even when not having been activated by light from the light boxes. This will provide a passive safety factor for motor vehicles incorporating the light strip.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A lightable display for attachment to a vehicle comprising an elongated member capable of transmitting light therealong, means for effecting transmission of light into at least one end of the said member, the elongated member having at least a back face shaped or otherwise arranged whereby to intercept some of the light in the direction of elongation and to effect an externally visible lighting of the back face.

2. A lightable display as in Claim 1 in which such externally visible lighting is promoted by the inclusion of a luminescent type material located along the said back face.

3. A lightable display as in Claim 1 or Claim 2 in which the externally visible lighting is effected by an alteration of the shape of the said back face.

4. A lightable display as in Claim 1 or Claim 2 in which the said externally visible lighting is effected by randomly shaped surface shape alterations in the said member along the said back face.

5. A lightable display as in any preceding claim wherein the member comprises at least two separate portions adapted to be secured each on a vehicle and each in alignment one with respect to the other leaving a gap therebetween and being shaped and otherwise arranged to effect a transmission of light across such gap.

6. A lightable display as in any preceding claim in which the member comprises a member of substantially constant cross sectional shape along its length.

7. A lightable display unit as in any preceding claim wherein the lighted display is affixed to a vehicle with the back against the vehicle wherein light means are located at each end of said elongated member.

8. A lightable display as in Claim 7 wherein said light means comprise an electric globe and reflector.

9. A lightable display as in Claim 7 wherein said light means comprise a glass fibre connection to a light source on said vehicle.

10. A lightable display as in any preceding claim wherein the member comprises a rod of semi circular cross-section the flat face providing the back face.

11. A lightable display as in Claim 10 wherein said back face is rough saw cut.

12. A lightable display unit as in any preceeding claim further including indicia engraved or otherwise embedded or affixed to the elongated member on its front or rear face whereby information may be displayed in the lightable display unit.

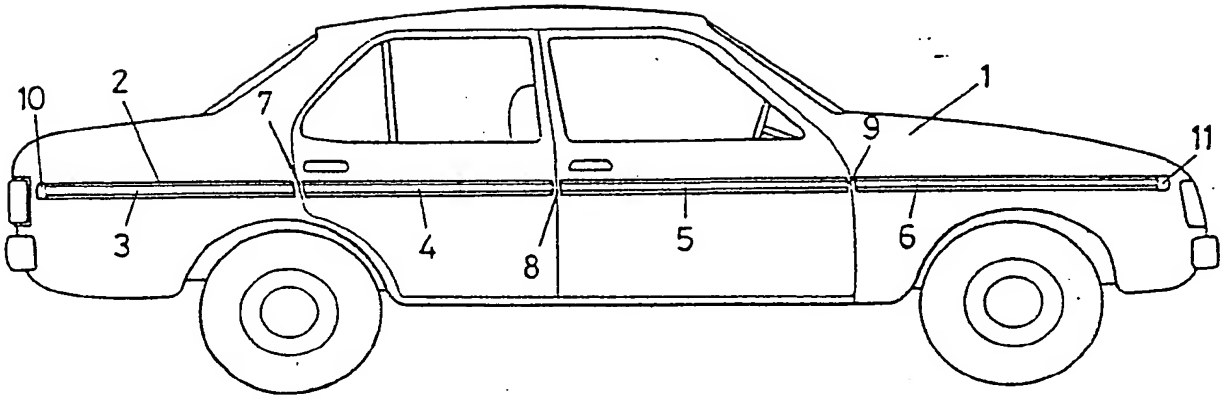
13. A lightable display unit for attachment to a vehicle substantially as hereinbefore defined with reference to the drawings.

14. A lightable display unit when attached to a vehicle substantially as hereinbefore described with reference to the drawings.

15. A lightable display attached to a vehicle comprising an elongated member capable of transmitting light there-

along said elongated member being composed of polymethyl-methalcrylate polymer and being of semi circular cross section the flat face thereof having a rough abraded surface and being coated with a luminescent paint, said elongated member being mounted on the sides of said with the flat base innermost, there being provided at each end thereof a light source comprising an electric light globe and reflector, whereby to transmit light into said elongated member.

FIG 1



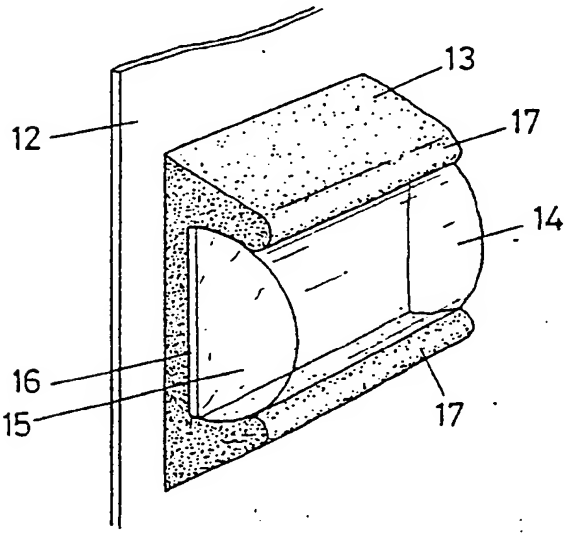


FIG 2

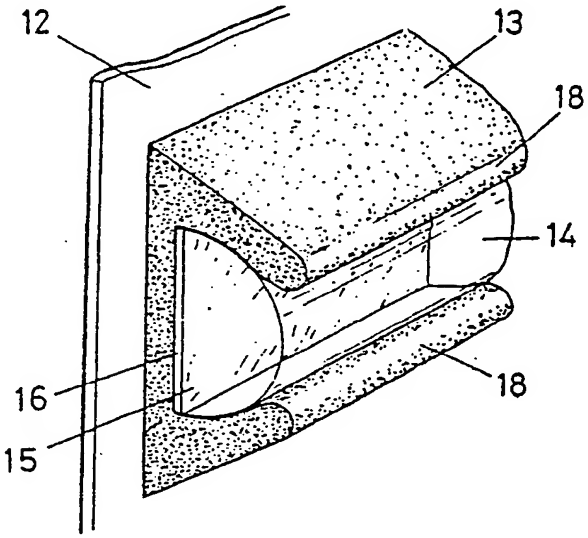


FIG 3

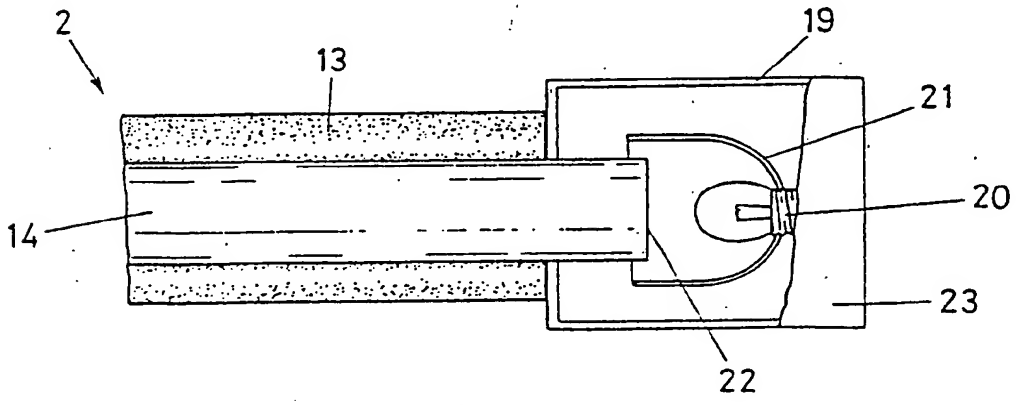


FIG 4

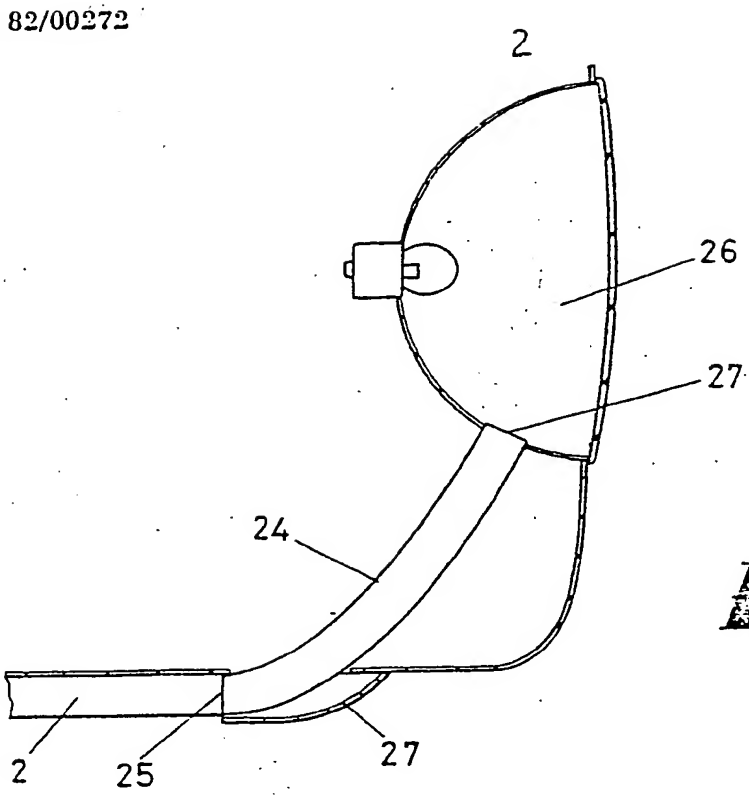


FIG 5

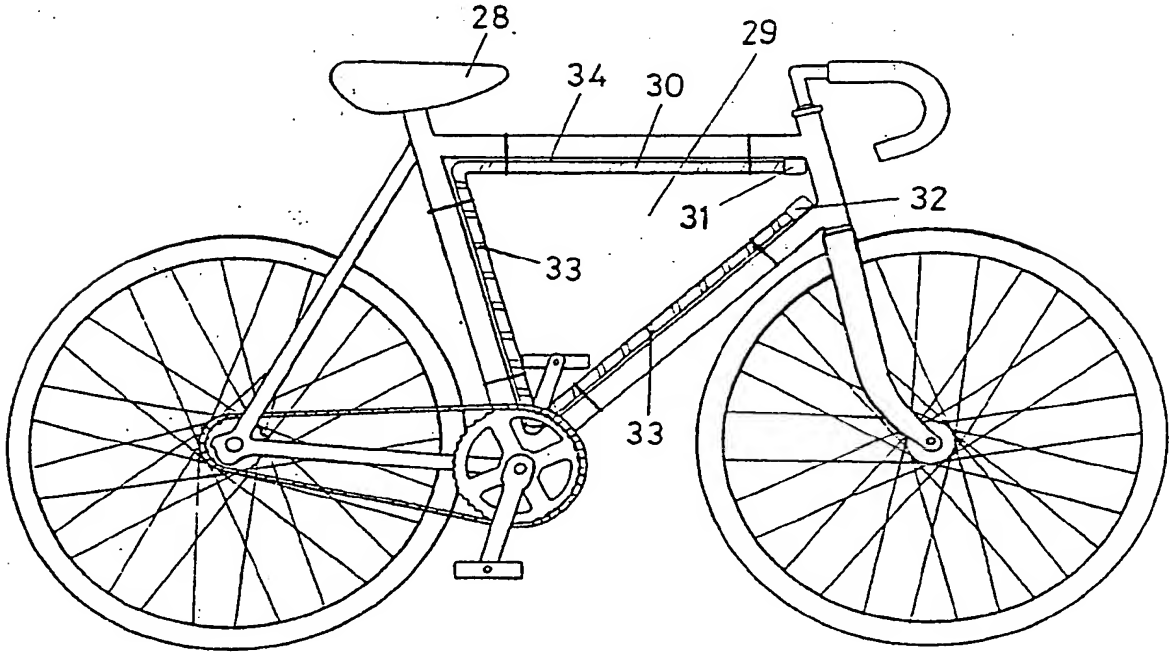


FIG 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/AU81/00090

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.[3] B60Q 1/26, B60R 13/04

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC	B60Q 1/26, B60R 13/04
US Cl.	362-84

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

AU:IPC as above; Australian Classification 93.9, 94.90, 94.940

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	AU, B, 11370/70 (428937) Published 1971, August19, Nihon Number Plate KK.	1,6-8,12
X	AU, B, 26967/77 (517677) Published 1979, January 18, VDO Adolf Schindling AG (& US, 4128859)	1,3,6,8
X	US, A, 2344241, Published 1944, March 14, Flint.	1,2,6,8,12
A	FR, A, 2370606, Published 1978, June 9, Trovato.	
A	FR, A, 2312393, Published 1976, December 24, Jola Kunststoff-und Holzverarbeitung Gunther J. Lang.	
X	US, A, 1367961, Published 1921, Feb. 8, Grigsby.	1,6-8

* Special categories of cited documents: [15]

"A" document defining the general state of the art

"E" earlier document but published on or after the international filing date

"L" document cited for special reason other than those referred to in the other categories

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but on or after the priority date claimed

"T" later document published on or after the International filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention

"X" document of particular relevance

IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
20 AUGUST 1981 (20.08.81)	25 AUGUST 1981 (25-08-81)
International Searching Authority [1]	**Signature of Authorized Officer [20]**
AUSTRALIAN PATENT OFFICE	A. S. MOORE A S Moore